

Does Transit Accessibility Matter to Increase Transit Ridership?

Transit Ridership and Transit Accessibility in Los Angeles Area

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INTRODUCTION

Los Angeles area has invested significantly to expand the capacity of public transportation. Yet, transit ridership is still under five percent per the American Community Survey (ACS). What are the reasons? Why transit ridership continues to decline nationwide? The reasons for low and declining transit ridership may include, but not limited to: low gas prices; poor, unreliable, and crowded transit services; presence of convenient services such as Uber/Lyft; less accessibility to bus stops and rail stations; different transit ridership of residents in urban or suburban areas; different transit ridership among different age groups or racial/ethnic groups. Several reasons contribute to such continuous low rate of public transit ridership. In this study, we focus on the relationship between transit ridership and transit accessibility in Los Angeles area using data provided by Southern California Association of Governments and spatial analyzing it with GIS. Is accessibility the key to raising public transit ridership or is it just not enough?

TRANSIT RIDERSHIP TRENDS

Although the percentage of commuters driving to work has been decreasing since 1990, percentage of commuters riding public transportation has also been declining, whereas the number of people working at home has increased drastically.

Means of Transportation (%)	1990	2000	2015
Car, Truck, or Van	85.6	85.4	83.2
Public Transportation	6.5	6.6	6.1
Motorcycle	0.5	0.2	0.3
Bicycle	0.6	0.6	1.0
Walked	3.3	2.9	2.8
Other Means	0.8	0.8	1.2
Worked at Home	2.7	3.5	5.4

* Taxicabs were excluded from Public transportation category from 2015

METHODOLOGY

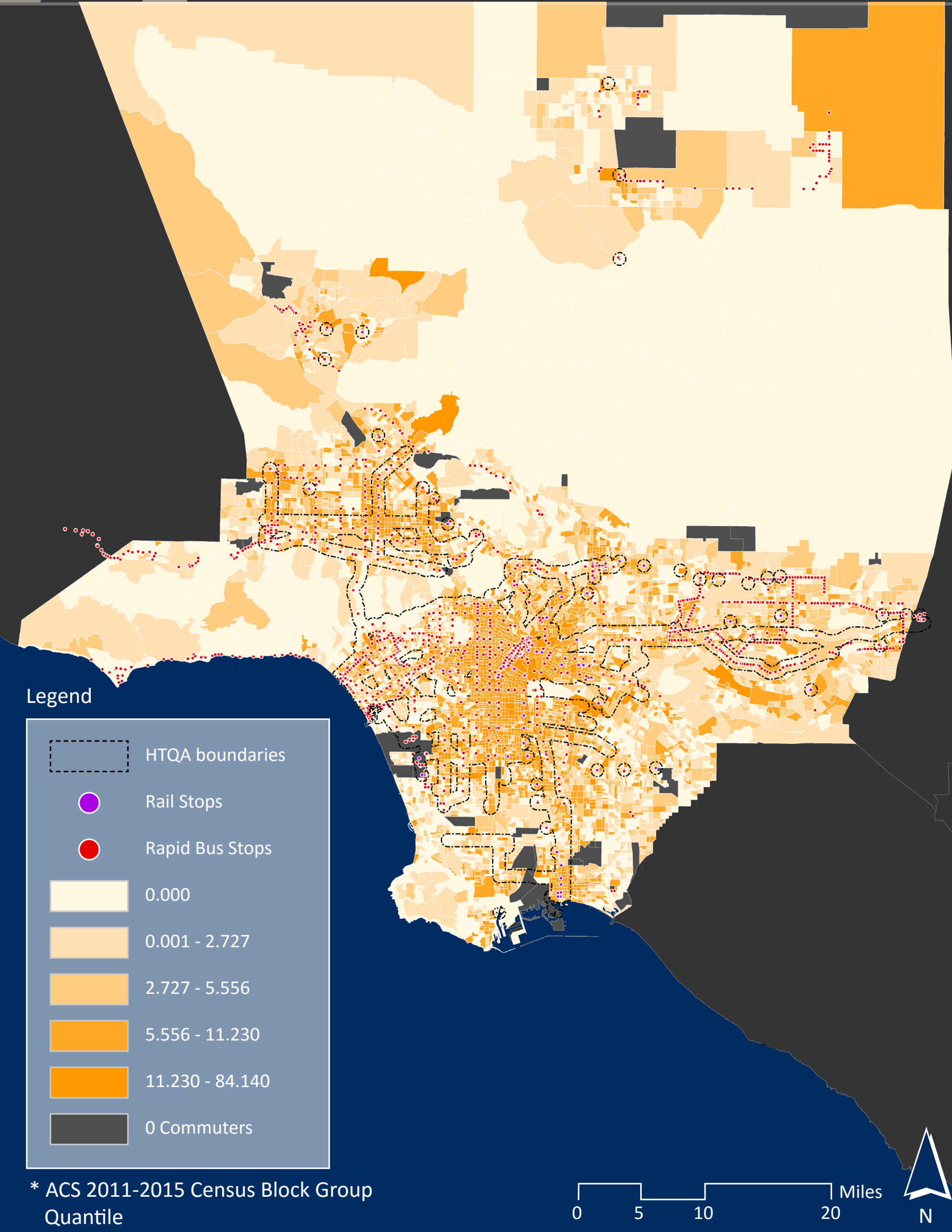
- 1
- Parcel data is overlaid with HQTA and Census Block Group boundary
- 2
- Number of bedrooms in each parcel is aggregated to HQTA area and non-HQTA area in each Census Block Group (CBG)
- 3
- Shares of bedrooms included in HQTA in each CBG are calculated
- 4
- Shares of bedrooms are multiplied to Employed Labor Force in each CBG to get employed labor force in each HQTA
- 5
- Employed labor force in each HQTA is multiplied to the share of workers who either drive or take public transit for commuting to get potential transit riders in each CBG
- 6
- Potential transit riders are divided by the total employed labor force in each CBG to get share of potential transit riders
- 7
- Share of potential transit riders are compared with the share of transit riders from ACS data

High Quality Transit Area (HQTA)

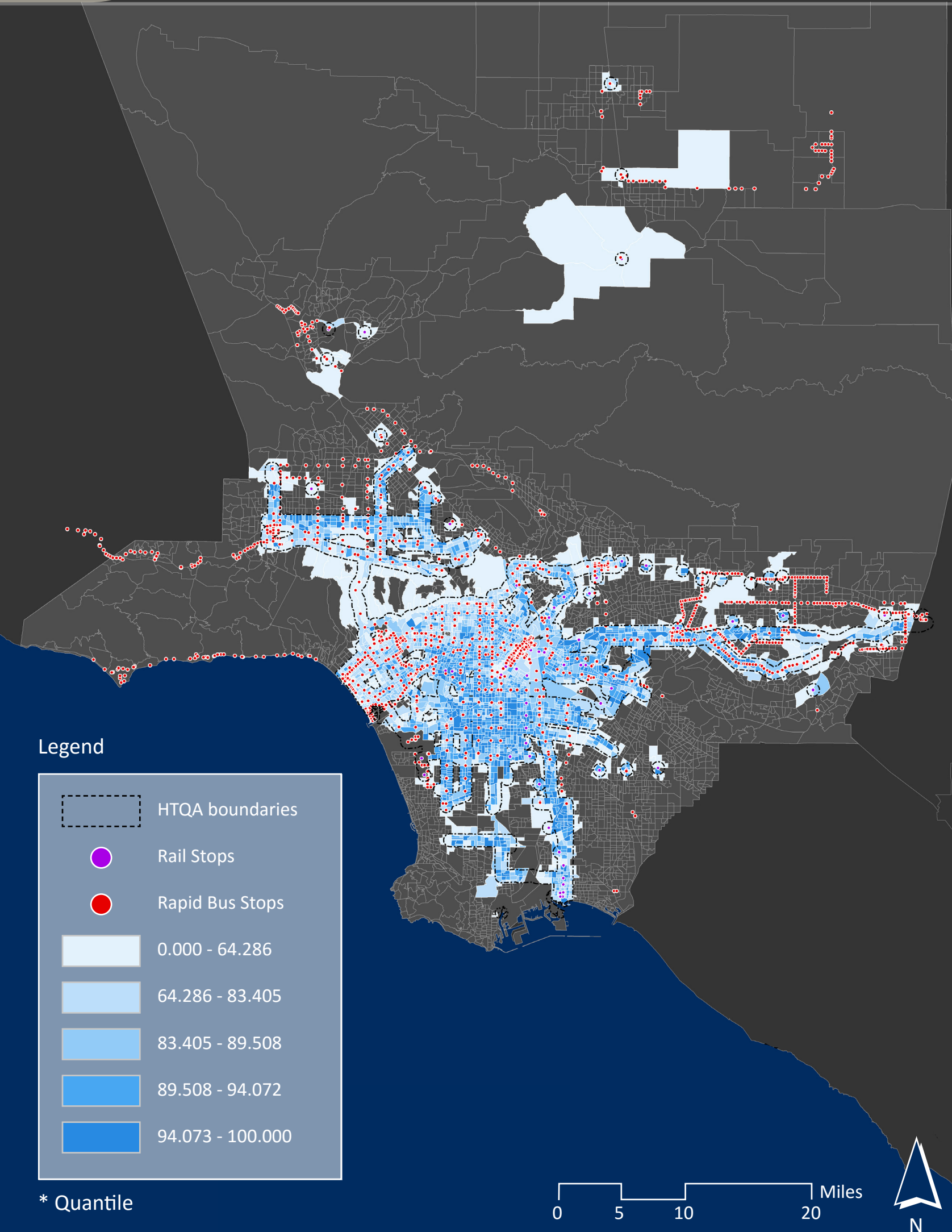
In order to determine the existing level of transportation system usage, SCAG analyzed the 2009 National Household Travel Survey (NHTS). The NHTS is the authoritative source of national data on the travel behavior of the American public. The dataset allows analysis of daily travel by all modes, including characteristics of the people traveling, their households and their vehicles. The 2009 data includes 69,817 households and 160,758 persons, and the travel diary data includes a total of 642,292 trips. In addition, the NHTS provides information on the household characteristics and travel behavior of residents living within high quality transit areas (HQTAs), which represent the half mile surrounding all rail transit stops and bus corridors that have peak headways of 15 minutes or less.

- Rail Stops include Commuter Rails and Local Rails
- Rapid Bus Stops include Bus Rapid Transit (BRT), Metro Express Bus, LADOT Commuter Express Bus, Rapid Bus, and other Express Bus

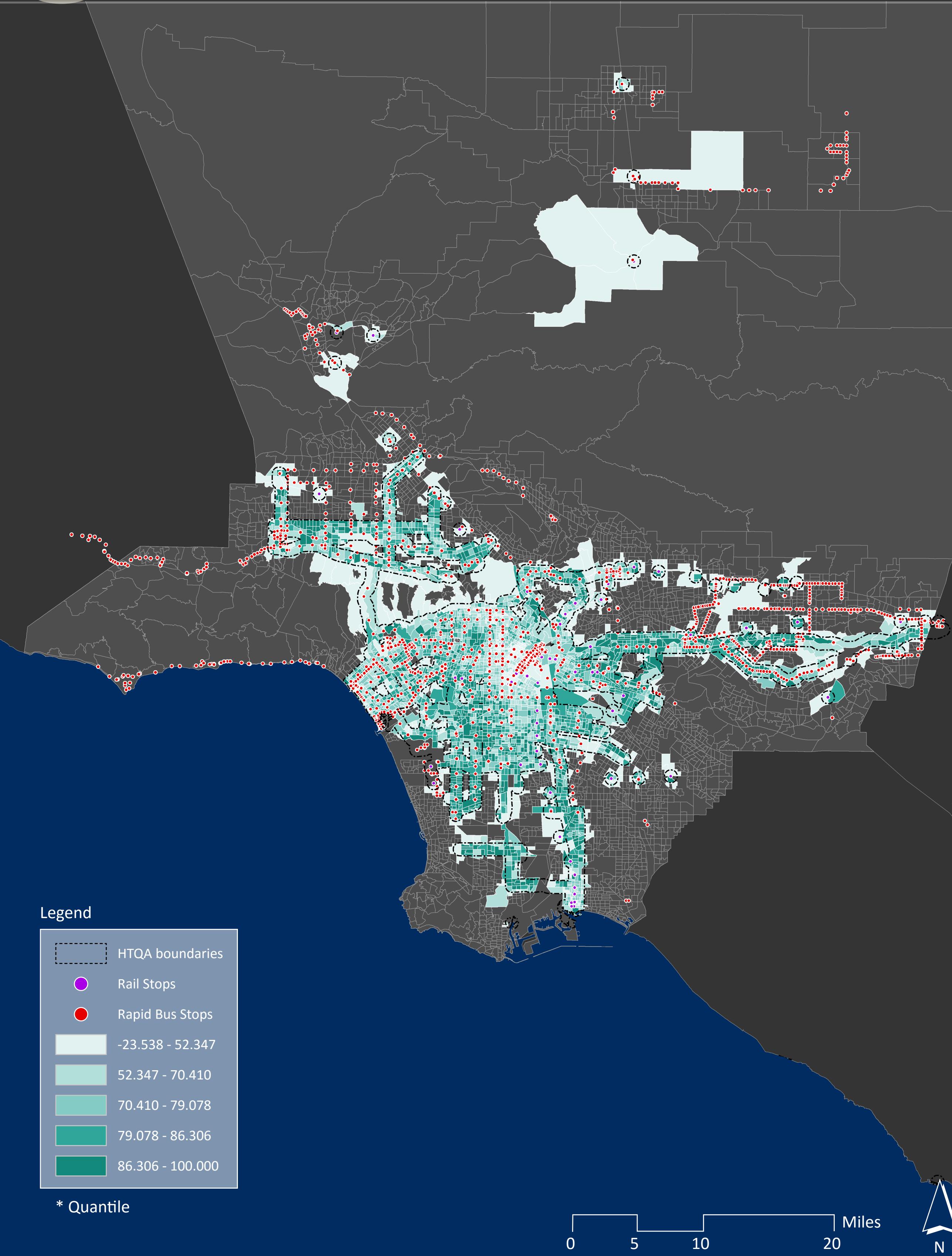
Percentage of Commuters Riding Public Transportation to Work in Los Angeles County (%)



Percentage of Possible Public Transportation Users Within HQTA (%)



Difference Between Possible User Rate and Current User Rate Within HQTA (%)

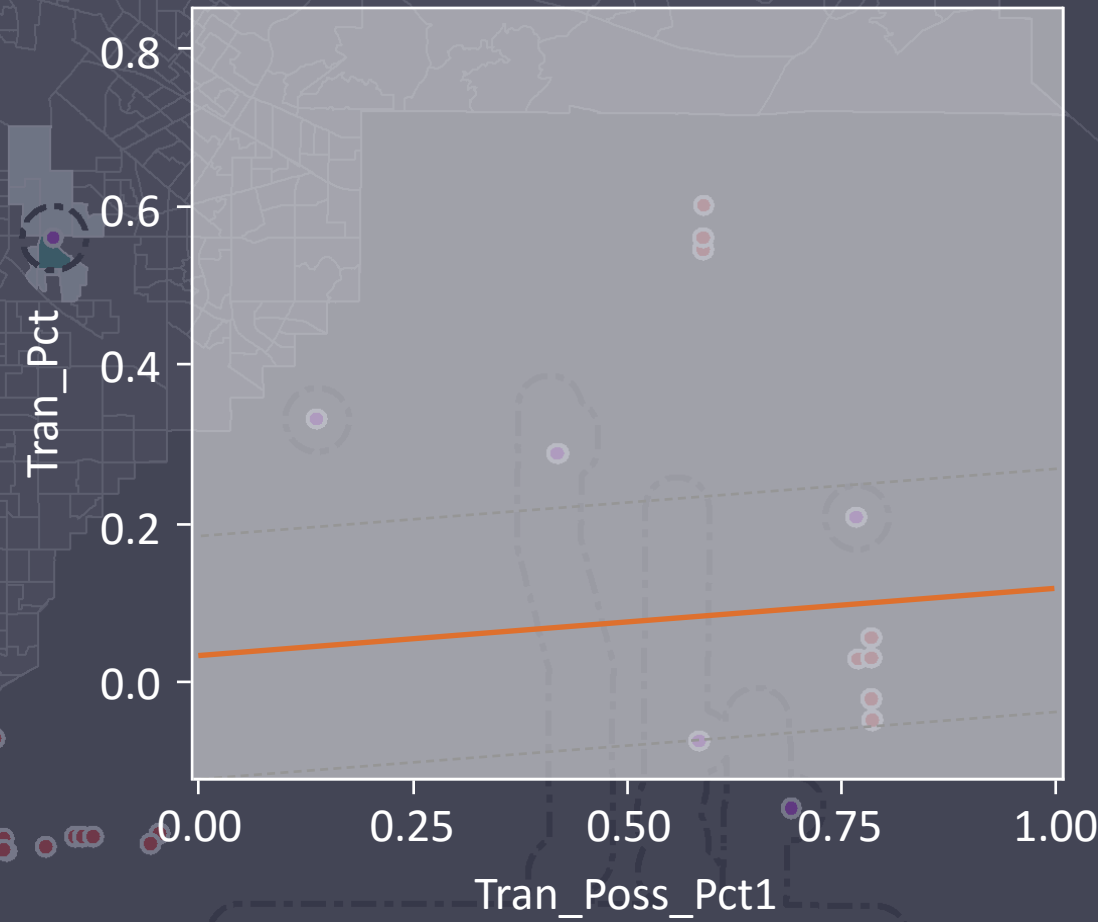


REGRESSION

Number of Observations Used	6376
R-square	0.1720

Parameter Estimates					
Variable	DF	Parameter Estimate	Standard Error	T Value	Pr > t
Intercept	1	0.03093	0.00139	22.27	<.0001
Tran_Poss_Pct1	1	0.08423	0.00231	36.39	<.0001

Fit Plot for Tran_Pct



Observations	6376
Parameters	2
Error DF	6374
MSE	0.0062
R-Square	0.172
Adj R_Square	0.1719

Dependent variable: Percentage of commuters riding public transportation to work (Tran_Pct)
Independent variable: Percentage of possible public transportation users (Tran_Poss_Pct1)

NEXT STEPS

- Q1.

Even though transit stops are available, if routes for work destinations are not available from the stops, how can workers use public transportation?
- A1.

CTPP and LEHD provides origin-destination flows for workers. The O-D pattern will be compared with existing transit routes to see if transit riderships are associated with route mismatch.
- Q2.

If transit accessibility explains only a part of the transit ridership in Los Angeles, what would be the other reasons and how can you verify it?
- A2.

There can be several other reasons. The pattern in Los Angeles can be compared with the one of other areas with high transit ridership. Real transit ridership data can also be used to find different patterns at stations.